A

REPORT ON

AN INDUSTRIAL WASTES SURVEY

of

CITY OF PETERBOROUGH

1970

by

Division of Industrial Wastes

ONTARIO WATER RESOURCES COMMISSION

A

REPORT ON

AN INDUSTRIAL WASTES SURVEY

of

CITY OF PETERBOROUGH

1970

by

Division of Industrial Wastes

ONTARIO WATER RESOURCES COMMISSION

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

PETERBOROUGH MUNICIPAL SURVEY - 1970

INTRODUCTION

An industrial wastes survey was carried out in the City of Peterborough by staff of the Division of Industrial Wastes from July to November 1970.

The purpose of the survey was to obtain information concerning the nature and quantity of industrial wastes being discharged to the municipal sewers and natural watercourses and to indicate where waste disposal is unsatisfactory.

The general information concerning the survey is contained in Part I of the report while the details of the individual surveys of industries are included in Part II. An explanation of the terms used to describe waste characteristics is given in Appendix A.

SUMMARY

Approximately two-thirds of the water used by industry is supplied by the municipal water system. The remainder is obtained from private wells and the Otonabee River. Slightly more than one-third of the total is discharged to the municipal sanitary sewers for treatment. This accounts for 10 to 15% of the hydraulic load on the municipal sewerage system.

A small part of the industrial wastes discharged to the storm sewer system should be diverted to the municipal sanitary sewers. An almost equal volume of uncontaminated cooling water should be removed from the sanitary sewers and discharged to storm sewers.

Almost all of the industrial BOD_5 loading now being discharged to the municipal sanitary sewers represents organic wastes from plants engaged in the processing of food or other agricultural products and is readily treatable by the activated sludge process. However, considerable amounts of heavy metals are also being discharged to the sanitary sewers. More complete pretreatment at the industry is required to reduce the heavy metals loading.

Excessive amounts of metals are being discharged as well to storm sewers which lead to a watercourse, but installation of waste treatment facilities to remove these contaminants is scheduled for completion by mid-1971.

CONCLUSIONS AND RECOMMENDATIONS

With the exception of the wastes from the metal finishing industry, no serious problems exist with present industrial waste disposal procedures. Plans for the removal and treatment of the main metals discharged to a watercourse were already approved before the survey was conducted. Recommendations for correction of the other problem areas discovered by the survey have been made to the industries involved.

Although the BOD_5 concentrations of several industrial effluents are in excess of those acceptable by the municipal sewer-use by-law (Appendix E), these organic discharges are readily treatable in the municipal sewerage system. The municipality should possibly consider imposing a surcharge for the treatment of high strength wastes.

Diversion of uncontaminated cooling water and roof drains from the sanitary sewer to the storm sewer has also been recommended to some industries.

P A R T I

PETERBOROUGH MUNICIPAL SURVEY - 1970

PART I

CONDUCT OF THE SURVEY

During the first stage of the survey all industrial establishments in the community were investigated to segregate them into dry or wet categories. The dry and wet industries are listed in Appendix B and C, respectively. Of the thirty-one industries visited, twelve were considered to be dry.

During the second stage of the survey, fourteen wet industries with significant waste loadings were revisited to measure waste volumes and to collect samples of the effluents. All waste samples were returned to the OWRC Laboratories in Toronto for analysis according to the procedures described in "Standard Methods for the Examination of Water and Wastewater", 12th edition. The five remaining wet industries which had relatively minor waste loadings were not sampled. A discussion of these industries is given on page 71 of the report.

Much useful information concerning the water usages at industries was received from Mr. D. M. Venton, P. Eng., Senior Engineer, Public Utilities Commission.

The assistance of Mr. Venton and the personnel of the industries surveyed is gratefully acknowledged. A list of the personnel interviewed at the wet industries is given in Appendix D.

The survey field work was conducted by Mr. T. Dafoe and Mr. H. O. Wigle of the Division of Industrial Wastes, Ontario Water Resources Commission.

MUNICIPAL SANITARY SEWAGE TREATMENT PLANT

The activated sludge type Peterborough Sewage Treatment Plant has a rated design capacity of 7.2 million gallons per day based on the size of the activated sludge portion of the plant. Although average daily sewage flows through the plant have been in excess of the plant's design capacity, a combination of good plant management together with a weaker than normal strength of sewage, has resulted in effluent quality being maintained within OWRC objectives. In consideration of the current high daily flows and high yearly rate of increase in daily flows, plant expansion has been recommended by staff of the Commission's Division of Sanitary Engineering so that a satisfactory plant effluent quality can be maintained in the forthcoming years. Action on this recommendation in the form of engineering studies and reports have now been authorized by the City.

INDUSTRIAL WATER USAGE AND WASTE FLOWS

All of the industries classified as wet in this report obtain water from the municipal water supply system. In addition, six industries also obtain water from private wells or the Otonabee River.

For industrial water usage, 2.1 mgd are taken from the PUC and 0.9 mgd are obtained privately. Very little of this water is incorporated in the products. It is estimated that 1.9 mgd of the water are discharged to the storm sewer after use while the remaining 1.1 mgd are discharged to the municipal sanitary sewer system. The industrial

..... 6

wastewater discharged to the sanitary sewer represents 10 to 15% of the hydraulic loading to the municipal treatment plant.

The water usage and waste flows for individual industries is given in Appendix C. It is estimated that approximately 0.2 mgd of uncontaminated cooling water are being discharged to the municipal sanitary sewers while a similar amount of contaminated wastewater is being discharged to the storm sewers.

INDUSTRIAL WASTE LOADINGS

The following is a summary of the daily BOD_5 and suspended solids loadings in the industrial waste discharges within Peterborough.

INDUSTRIAL WASTE LOADINGS PER OPERATING DAY*

	Discharged to Municipal Sanitary Sewer	Discharged to Other Points
Waste Flow, mgd	1.1	1.9**
BOD_5, lbs/day	2,900	-
Suspended Solids, lbs/day	1,300	-

* Waste flows and loadings do not include sanitary wastes

** Includes 1.7 mgd of uncontaminated cooling water

The major sources of the BOD_5 and suspended solids loadings are as follows:

SOURCES OF INDUSTRIAL WASTE LOADINGS

(lbs/day operating day)

Company	No. of Operating Days per week	Discharged to Sanitary Sewer BOD_5	Discharged to Sanitary Sewer S.S.	Flow mgd
Brinton Carpets Limited	5	269	35	.062
Checkerboard Farms Limited	5	900	600	.110
Ovaltine Food Products Limited	5	1,100	345	.050
Quaker Oats of Canada Limited	5	245	104	.015
Silverwood Industries Limited	5	260	105	.320
G. Whitaker and Company Limited	2	55	65	.004
TOTAL		2,829	1,254	

Other significant contaminants include cyanide and heavy metals from the metal finishing industry. These loadings are estimated to be as follows:

METAL FINISHING WASTE LOADINGS

(lbs/operating day)

	Discharged to Sanitary Sewer	Discharged to Storm Sewer
Cyanide as HCN	.22	3.96
Copper as Cu	.89	10.1
Cadmium as Cd	.11	-
Chromium as Cr	4.9	11.05
Lead as Pb	-	.40
Nickel as Ni	.995	.10
Zinc as Zn	2.25	8.5

Most of the heavy metals being discharged to the storm sewer will be eliminated by mid-1971 upon completion of the new plating shop and waste treatment facilities at Canadian General Electric Company Limited.

PART II

PETERBOROUGH MUNICIPAL SURVEY - 1970

PART II

- BRINTON CARPETS LIMITED -

SUMMARY

All waste waters from this plant, except the boiler blowdown, are discharged to the municipal sanitary sewer. The boiler blowdown is being discharged to the river at present but will be diverted to the sanitary sewer in 1971.

Most of the liquid wastes from this plant are produced by carpet dyeing and yarn washing or scouring. The wastewater has a BOD_5 concentration slightly in excess of the by-law requirement but has a low suspended solids concentration.

DETAILS OF SURVEY

Plant Operations and Operating Data

This plant manufactures carpets by weaving various yarns into rugs which are then dyed to produce the finished product. The plant employs 220 people and operates 5 days/week. The carpet dyeing and yarn scouring operations take place 8 hrs/day and the weaving occurs 16 - 24 hrs/day as required.

Water Sources, Usage and Disposal

All of the water is obtained from the PUC and the water usage for scouring yarn, and dyeing and rinsing carpets is estimated to be

..... 10

62,000 gals/day. The wastes are released as batch dumps to a holding tank which equalizes the flow and strength of the wastewater before it enters the municipal sanitary sewer. Sanitary wastes are collected and discharged to the sanitary sewer by a separate sewer line. At present the boiler blowdown water is being discharged to the Otonabee River but plans have been made to divert this discharge to the sanitary sewer in 1971.

Sampling, Analysis and Waste Loadings

Composite samples of the total plant effluent were obtained on October 6, 1970. As well, grab samples of the scouring tank contents were obtained at the end of the day before the tanks were emptied. Results of the analysis of the samples are shown as follows:

WASTE CONCENTRATIONS AND LOADINGS

Total Waste Flow = 62,000 gals/day

Effluent Stream	Concentration			Loadings, lbs/day		
	BOD_5	Susp. Solids	Mitin	BOD_5	Susp. Solids	Mitin
Total Effluent 60,000 gals/day	400	52	0.23	240	30	.12
*1st Scour 625 gal	3,000	640	-	20	3.6	-
*2nd Scour 600 gal	1,200	200	-	7.2	1.2	-
*Scour Rinse 600 gal	95	30	-	.6	.1	-
				267.8	35	.12

* Batch dump at end of day.

..... 11

Waste loadings discharged to the municipal sanitary sewer are therefore approximately 268 lbs/day BOD_5 and 35 lbs/day suspended solids.

CONCLUSIONS

In general, the plant's wastewater is of an acceptable nature for discharge to the municipal sanitary sewer. High BOD_5 concentrations are present in the wastewater from the scouring tanks but the volumes from these tanks are small compared to the total plant effluent.

The Mitin (moth proofing agent) concentration in the total effluent was found to be 0.23 ppm. Laboratory tests have shown that adverse effects on the activated sludge system should not occur with Mitin concentrations of 10 ppm or less. The tests also show a removal of up to 75% of the Mitin by the activated sludge process.

Once the boiler blowdown has been connected to the municipal sanitary sewer, the method of waste disposal utilized by Brinton Carpets Limited will be considered to be satisfactory.

PETERBOROUGH MUNICIPAL SURVEY - 1970

- CANADIAN GENERAL ELECTRIC COMPANY LIMITED -

SUMMARY

The major source of pollution at this plant, namely the discharge of untreated plating wastes to the Townsend Street storm sewer will be discontinued in mid-1971 upon completion of the new plating shop and waste treatment facilities. Other remaining problem areas are a discharge of phenolic waste waters to the Albert Street storm sewer and intermittent discharges of various sumps and paint booths throughout the plant. The Company is engaged in diverting the known sources of wastes to the sanitary sewer system. It is recommended that the Company make a more concerted effort to locate sources of contaminated waste waters entering the storm sewers so that they may be adequately treated at the plant or diverted to the municipal sanitary sewer at the earliest possible date.

DETAILS OF SURVEY

Personnel Interviewed

Mr. P. Hoes, Manager, Plant Engineering Unit

Officers of the Company

Mr. S. Adamson, Plant Manager

Mr. C. B. Muir, Manager, Plant Facilities

..... 13

Description of Plant and Processes

The Canadian General Electric Company Limited plant at Peterborough is engaged in the production of electrical and electronic equipment and supplies.

The main operations performed in the plant are:

(1) Machine shop and metal forming operations.

(2) Motor and generator parts manufacture and assembly.

(3) Wire and cable extrusion, enameling and insulating.

(4) Electronic equipment assembly.

(5) Nuclear fuel bundle and fuel handling equipment manufacture.

(6) Metal degreasing and electroplating.

(7) Coil impregnating.

(8) Painting.

(9) Steam Production and boiler water treatment.

A wide variety of electroplating and cleaning operations are carried out in the plating department. These include, chromium, zinc, tin, nickel and silver plating as well as aluminum anodizing, cleaning, pickling, brightening, paint stripping and degreasing. The present plating shop is being replaced with a completely new shop which is to be completed in mid-1971.

In the wire and cable department, wire is passed through a phenolic-based enamel and fed into vertical forced-air drying ovens. The off-gases from six of these ovens is passed through catalytic oxidation units to destroy the phenol. The remaining 10 ovens have a water-

..... 14

scrubbing unit to remove the phenol prior to venting of the gas to the atmosphere. The water is then discharged to sewer. These remaining ovens are to have catalytic oxidation units installed on them by the end of 1973.

Production and Operating Data

Most sections of the plant operate 5 days per week, 8 hours per day. Some departments operate on different schedules. Some of these are listed below:

Plating Department	- 10 hrs/day	5 days/week
Wire and Cable	- 24 hrs/day	7 days/week
Paint Booths (Bldg. 16 A)	- 12 hrs/day	5-1/2 days/week

Approximately 4,800 persons including laboratory and office staff are employed at the plant.

Water Usage and Distribution

Average water consumption is approximately 1.5 mgd of which 1.2 mgd is obtained from the municipality and the remaining 0.3 mgd is obtained from a well on Company property.

The Company has been actively reducing water uses. Reductions in water consumption have been due to the installation of "water-misers" on spot welders and hydraulic units as well as the phasing out of old water consuming air conditioners for roof-top models (dry-type). A summary of water purchases from the PUC is given below:

1964	- 74,684,000 cu. ft.
1965	- 73,517,000 cu. ft.
1966	- 85,282,500 cu. ft.
1967	- 83,011,400 cu. ft.
1968	- 73,991,500 cu. ft.
1969	- 73,053,800 cu. ft.
1970	- 70,000,000 cu. ft. (estimated)

Most of the water used for cooling as well as uncontaminated process water is collected in underground reclaim water reservoirs which make-up part of the manufacturing water system. This reclaimed water is used for noncritical cooling, cleaning and processing purposes. The plant well-water is used as make-up for the manufacturing system. The manufacturing water system does have provision for overflow to sewer in case of emergency.

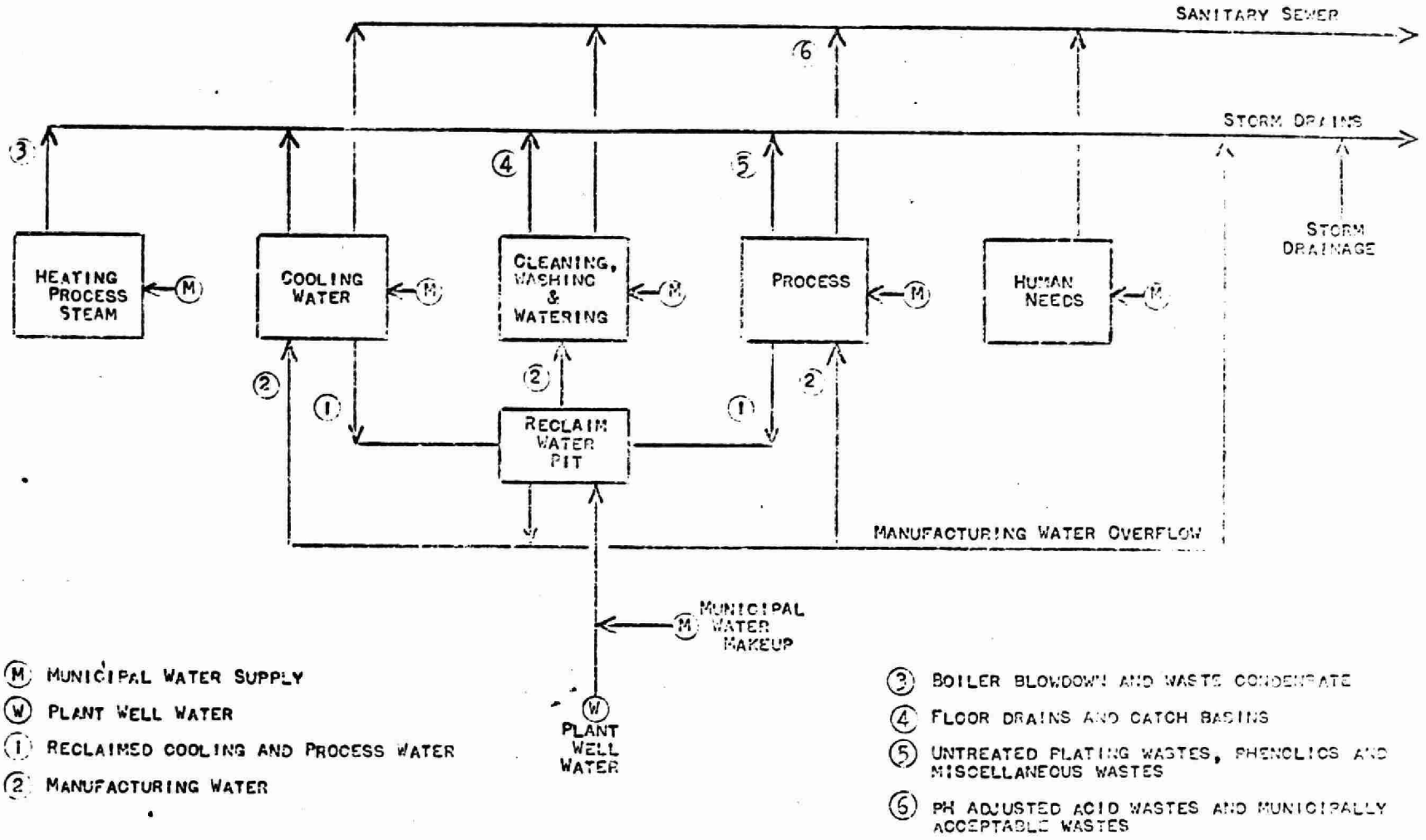
Municipal water is used for domestic purposes, laboratories, boiler feed, special processes and cooling purposes. Municipal water can also be used for make-up in the manufacturing water system.

A schematic diagram of the plant water and wastewater system is shown on page 16.

A schematic diagram showing the plant storm sewers and their drainage areas is on page 17.

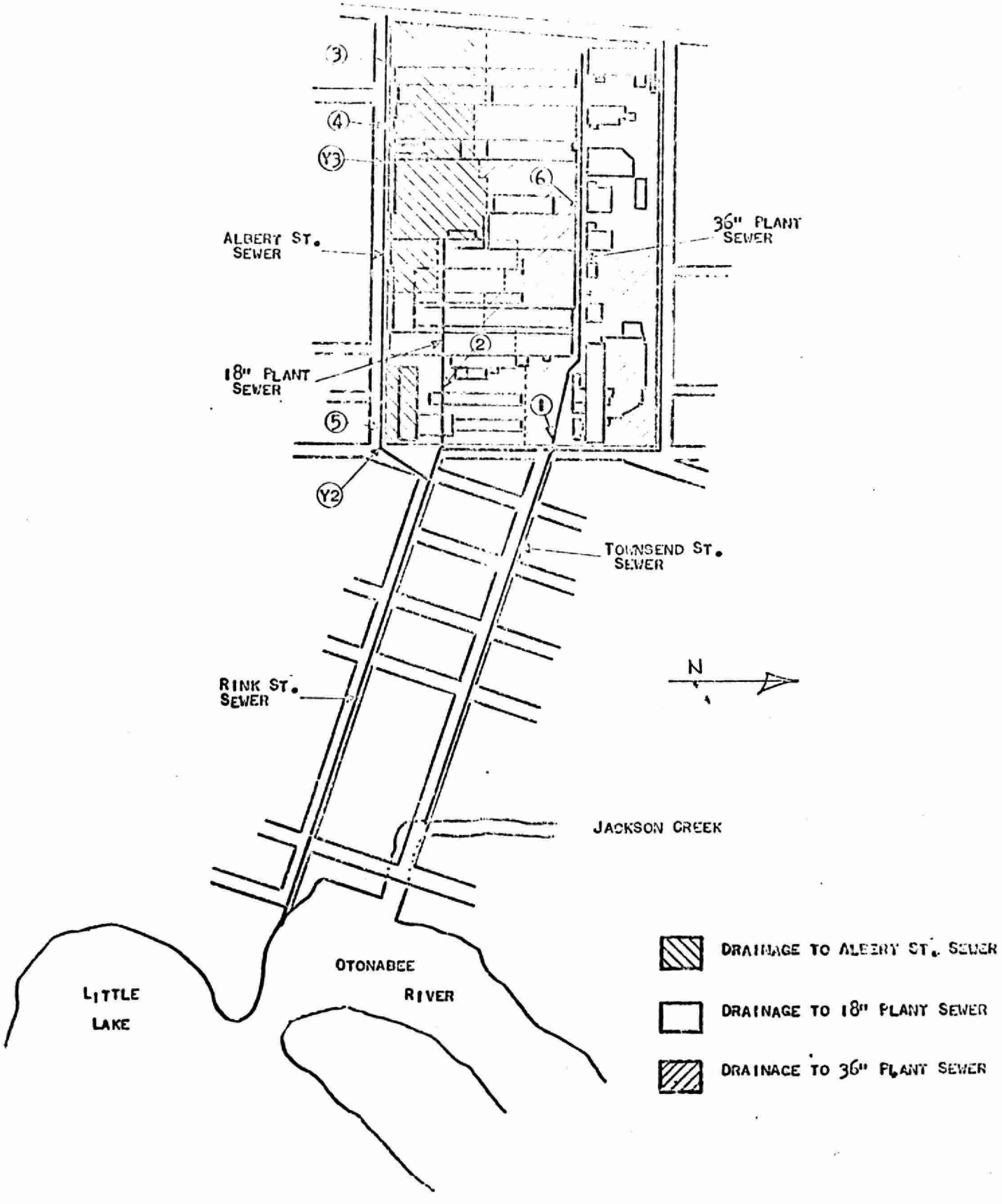
SOURCES AND DISPOSAL OF LIQUID WASTES

All sanitary wastes are discharged to the municipal sanitary sewers. Some process wastes are also discharged to the sanitary sewer. A programme



WATER SUPPLY AND DRAINAGE SYSTEM SCHEMATIC

PETERBOROUGH MUNICIPAL SURVEY - 1970



of re-routing contaminated process waste streams from the storm sewer to the sanitary sewer is underway. Also in some areas the plant roof drains discharge to the sanitary sewer, placing an unnecessary hydraulic loading on the municipal sanitary sewerage system during periods of precipitation.

The plant is serviced by three storm sewers, a 36-inch plant storm sewer discharging to Jacksons Creek via the Townsend Street storm sewer, an 18-inch plant storm sewer discharging to Little Lake via the Rink Street storm sewer, and the 24-inch Albert Street storm sewer which also discharges to Little Lake via the Rink Street storm sewer.

The principal source of industrial wastes discharging to the storm sewers is the old plating shop effluent. This discharges untreated to the 36-inch plant storm sewer. Upon completion of the new plating shop and waste treatment facilities in mid-1971 this waste will be greatly reduced in volume and concentration and will be discharged to the municipal sanitary sewers.

The wire enameling waste waters containing high concentrations of phenolics have been diverted from the Albert Street storm sewer to the sanitary sewer. However, the concentration of phenols (1,500 ppb) in the storm sewer indicates that some wastes from this area are yet to be re-routed.

Miscellaneous discharges from spray paint booths and various sumps were found to be discharging to the storm sewers. These were pointed out

to the Company and were to be diverted to a sanitary sewer immediately or during 1971. A list of these locations is as follows:

(1) Soap Pit - Building #24 - diverted to sanitary sewer.

(2) Paint Booth - Building #16A - to be diverted in 1971.

(3) Electropainting Waste - Building #34 - diverted to sanitary sewer.

(4) Paint Booth - Building #10 - to be diverted in 1971.

(5) Paint Booth - Building #14 - to be diverted in 1971.

(6) Paint Shop Sump - Building #15 - diverted in 1970.

(7) Paint Booth - Building #26 - to be diverted in 1971.

Waste oil throughout the plant is collected and used for dust control in summer. In winter, the oil is collected in drums and disposed of at a land-fill site.

Waste askarels from the capacitor and transformer filling operations in Building #4 are now collected in drums for return to Monsanto.

Waste Flows

No waste flows were available for the period surveyed. Flow determinations carried out by plant personnel are listed below:

18" storm sewer	-	110,000 gpd
36" storm sewer	-	650,000 to 800,000 gpd
		1,100,000 to 1,400,000 gpd during precipitation.
Plating Shop	-	145,000 gpd

..... 20

There are no points on the Albert Street storm sewer where flow determinations can be made. Discharge to the Albert Street sanitary sewer from the scrubbers on the wire enameling ovens is in the order of 100,000 gpd.

Sampling and Analysis

Composite samples were obtained on October 22, 1970, from the following locations:

Sample Point	Location
#1	18 inch sanitary sewer at building #3
#2	18 inch sanitary sewer at building #8A
#3	Albert Street sanitary sewer at building #8
#4	Albert Street storm sewer at building #30
#5	18 inch storm sewer at building #20
#6	36 inch storm sewer at building #3
#7	Old Plating Room Effluent

In addition to the above composite samples a number of grab samples were obtained. These are:

#8	Manufacturing Water Sump - Building #24
#9	Soap Pit overflow to Albert Street storm sewer - Building #24 (JULY 1970)
#10	Spray Paint Booth overflow to Albert Street storm sewer - Building #16A

All samples were analysed at the OWRC Laboratories in Toronto in accordance with the procedures outlined in the 12th Edition of "Standard Methods for the Analysis of Water and Wastewater".

A summary of the analytical results is given on page 22.

DISCUSSION OF FINDINGS

The problem areas identified during the survey include the remaining discharge of phenols and the periodic discharges of other contaminated wastes to the Albert Street storm sewer, and the plating waste discharge to the 36-inch plant storm sewer.

The wastes discharged to the Albert Street storm sewer have on occasion been cited as the cause of a milky discolouration of Little Lake in the vicinity of the Rink Street storm sewer outlet. The soap pit overflow was definitely found to be a major cause of this discolouration. When the source was identified the Company immediately agreed to divert this waste to the municipal sanitary sewers. However, from time to time a milky colour is still evident at Little Lake. It is thought that the batch discharges from the spray paint booth sumps may be a cause of the problem. The Company has agreed to divert these flows to the sanitary sewers during 1971.

The phenol concentration of 1,500 ppb in the Albert Street storm sewer suggests that all of the contaminated scrubbing waters from the wire enameling ovens have not been diverted to the sanitary sewer. The Company has embarked on a programme to install catalytic oxidation units to oxidize the phenols in the off-gases, thus eliminating the need for scrubbing water. These are scheduled to be completely installed in 1973.

..... 22

ANALYTICAL RESULTS

SAMPLE POINT	FLOW GPD	BOD_5 PPM	BOD_5 LBS/DAY	SUSP. SOLIDS PPM	SUSP. SOLIDS LBS/DAY	PHENOLS PPB	PHENOLS LBS/DAY	COPPER AS CU PPM	COPPER AS CU LBS/DAY	ZINC AS ZN PPM	ZINC AS ZN LBS/DAY	CHROMIUM AS CR PPM	CHROMIUM AS CR LBS/DAY	CYANIDE AS CN PPM	CYANIDE AS CN LBS/DAY	PHOSPHATE AS P PPM	PHOSPHATE AS P LBS/DAY	PH
1	NONE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	NOT AVAILABLE	30	-	50	-	2	-	-	-	-	-	-	-	-	-	0.40	-	6.9
3	NOT AVAILABLE	26	-	5	-	1250	-	-	-	-	-	-	-	-	-	.032	-	7.2
4	NOT AVAILABLE	10	-	5	-	1500	-	-	-	-	-	-	-	-	-	-	-	7.2
5	300,000 *	9	27	5	15	30	.09	-	-	-	-	-	-	-	-	-	-	7.3
6	1,200,000 *	24	288	10	120	30	.36	1.40	16.8	1.23	14.8	1.20	14.4	0.16	1.9	-	-	7.4
7	150,000	-	-	30	45	-	-	6.6	9.9	5.5	8.3	7.3	11.0	2.6	3.9	-	-	7.4
8	INFREQUENT	30	-	10	-	300	-	-	-	-	-	-	-	-	-	-	-	7.4
9	INTERMITTENT	44,000	-	6,500	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	INTERMITTENT	33	-	40	-	85	-	-	-	-	-	-	-	-	-	-	-	-

* THERE WAS A STEADY RAIN ON DAY OF SAMPLING.

The heavy metal concentrations found in the 36-inch plant storm sewer arise from the plating operations within the plant. These will be virtually eliminated upon completion in mid-1971 of the new plating shop which will include comprehensive treatment for all plating wastes, with discharge of the treated effluent to the municipal sanitary sewer system.

A number of areas were noted where wastes could potentially enter the storm sewers. One of these was the Paint Shop (Building #14) where all wastes from the building flowed to a sump in the basement from which they were pumped to the 36-inch storm sewer. During the survey the wastes in the sump were found to contain waste oil. The Company agreed to have this situation corrected as soon as possible.

CONCLUSIONS AND RECOMMENDATIONS

Upon completion of the new plating shop in mid-1971 the major pollution problem at the Canadian General Electric Company Limited plant in Peterborough will be eliminated. There will remain, however, a number of small problems to be corrected within the plant which are potential sources for contaminated wastes entering the storm sewer. During the survey of October 22,1971, some of these were noted and Company personnel agreed to make the necessary changes to correct them. However, due to the size and complexity of this plant there may be other unsatisfactory situations throughout the plant that were not observed during the survey.

In view of this, it is recommended that the Company make a more concerted effort to locate actual or potential sources of contaminated wastes entering the storm sewers and to either treat these wastes or discharge them to the municipal sanitary sewer at the earliest possible date.

The Company should also review the use of water at the wire enameling ovens with the aim of determing the source of high phenol concentrations in the Albert Street storm sewer.

PETERBOROUGH MUNICIPAL SURVEY - 1970

- CHECKERBOARD FARMS LIMITED -

SUMMARY

This industry is a major source of the industrial BOD_5 loading discharged to the municipal sanitary sewer system. BOD_5 and suspended solids concentrations in the wastewater are above municipal by-law levels. The wastes, however, are readily treatable in a biological treatment system. Very little else can be done within the plant to reduce BOD_5 and suspended solids loadings.

Losses of fat from the plant has caused plugging of the municipal sanitary sewer. It is recommended that an improved grease trap be installed to prevent the escape of fat to sewer.

DETAILS OF SURVEY

Composite samples of the various continuous plant effluents were collected on July 22, 1970 along with grab samples of the batch dumps.

Plant Operations and Operating Data

The chickens are killed, bled, defeathered with hot water, eviscerated rinsed with cold water, chilled and packaged. Most of the water is used to transport solid wastes from the processing area. Blood is collected separately and taken by a rendering plant.

The plant operates 8 hours/day, 5 days/week, and employs 30 to 35 people. At the time of survey in July, the plant was processing one-half its capacity of 20,000 chickens per day. By November, processing had

..... 26

increased to 18,000 chickens per day. This is expected to be the maximum rate of processing.

Water Usage and Waste Disposal

Water usage is estimated to be 109,000 gpd based on usage during the survey period. All of the water is obtained from the PUC and all wastewater is discharged to the municipal sanitary sewer. Most of the water is used as a means of transporting feathers and offal from the working area. The feathers and offal are separated from the wastewater by rotating screens. The wastewater is then passed through a grease trap and discharged to the municipal sanitary sewer.

Analysis of Samples and Waste Loadings

Results of the analysis of the samples taken and the calculated waste loadings are shown on page 27.

DISCUSSION

At the time of the survey, total waste loadings from the plant were 477 lbs/day BOD_5 and 327 lbs/day suspended solids with a volume of 109,000 gpd of wastewater. Although production has doubled, the water consumption has remained the same since the plant was using the amount of water required for full production at the time of the survey. BOD_5 and suspended solids loadings are estimated to have increased to 900 lbs/day and 600 lbs/day respectively due to increased production.

The grease trap is hydraulically overloaded and is therefore very ineffective in removing fat. Plugging of the municipal sanitary sewer by fat has occurred.

WASTE CONCENTRATIONS AND LOADINGS

(Total Waste Flow = 109,000 gpd)

Effluent Stream	Concentration (ppm)			Loadings (lbs/day)		
	BOD_5	Susp. Solids	Diss. Solids	BOD_5	Susp. Solids	Diss. Solids
Crate Washer - 1st stage 3,150 gpd	50	310	210	1.6	10.3	6.28
Crate Washer - 2nd stage 3,150 gpd	80	50	240	2.5	1.6	7.68
Feather Screen Effluent 49,800 gpd	320	230	320	159	115	159
Offal Screen Effluent 37,300 gpd	700	450	170	261	168	63.5
Final Wash Water 7,480 gpd	5.0	25	175	.38	1.85	13.1
Vacuum Seal Effluent 3,150 gpd	5.0	10	170	.16	.32	5.45
Scald Tank* 1,870 gpd	200	260	740	4.2	5.5	15.5
Chill Tank* 3,150 gpd	1,300	330	1,260	40.2	10.3	39
TOTAL LOADINGS IN LBS/DAY				497.1	326.9	329.5

* Scald and Chill Tanks are dumped at end of processing day.

CONCLUSIONS AND RECOMMENDATIONS

Since the survey, flotation valves have been installed on the crate washer, and the overflow of water has been reduced by approximately 50%.

Further reductions in the waste volume discharged to the municipal sewer can be made. The water used as a seal for the vacuum pump can be either discharged to a storm sewer or recycled. More of the water used to transport the feathers can be recycled.

Plugging of the municipal sanitary sewer has occurred as a result of losses of fat from the plant. It is recommended that an improved grease trap be installed.

PETERBOROUGH MUNICIPAL SURVEY - 1970

- DE LAVAL COMPANY LIMITED -

SUMMARY

Strong pickling and plating solutions from this plant are dumped periodically to the City storm sewers. This practice can cause impairment of the Otonabee River and corrosion of the sewers. It is recommended that this practice be discontinued until facilities for adequate treatment can be provided. It is recommended that the Company determine the complete characteristics of the total wastes including batch dumps and provide the necessary treatment to make the discharges satisfactory for disposal to sewer.

DETAILS OF SURVEY

A series of samples were obtained from this plant on October 5, 1970. As neither the pickling shop nor the plating shop were operating during the survey, all samples obtained were grab samples of baths which are dumped periodically.

Description of Process

This plant is engaged in the fabrication of stainless steel tanks, fittings, and other equipment principally for the dairy and brewing industries. Most operations are dry (e.g. welding and assembly) except for small pickling and plating shops which operate intermittently. All contaminated liquid wastes originate from these areas, both of which are located in the North Plant.

..... 30

Personnel Participating

Mr. J. J. Toth, Production Superintendent

Mr. R. Delamere, Plant Engineer

Mr. D. Walker, Assistant Plant Engineer

Operating Data

No. of Employees	- 360
Operating Schedule	- 5 days/week
	- 16 hrs/day - South Plant
	- 8 hrs/day - North Plant
	- 1/2 to 1 day/week - Plating Shop
	- 30 hrs/week avg. - Pickling Shop

Water Usage

All water is obtained from the municipal water supply system. During 1969 the average water consumption was approximately 44,000 gallons daily, for all uses. No estimate was available for the proportion used for sanitary and steam production purposes. However, during operation of the pickling and plating shops, it was estimated that approximately 50 gpm are used in each of these areas for rinsing purposes.

Sources of Wastes and Disposal

All wastes from the pickling and plating shops are discharged to the City of Peterborough storm sewer. These wastes include both running rinses during normal operation as well as periodic dumps of strong pickling and plating solutions. Below are summaries of the amounts and contaminant concentrations of a number of these solutions as well as the number of times they are dumped annually.

PICKLING SHOP

Solution	Volume Gallons	No. of Dumps Per Year	pH	Alkalinity as $CaCO_3$ ppm	Acidity as $CaCO_3$ ppm	Iron as Fe ppm
Caustic Cleaner	250	2	13.2	12,000	-	-
Sulphuric Acid Pickle	180	2	*	-	280,000	22,800
Muriatic Acid Pickle	-	-	*	-	190,000	34,000
Ox-Off Tank	150	1	*	-	160,000	9,200

* pH is too low to measure, note acidities

Other solutions of which samples were not obtained are:

(1) Bright Dip - 10 gallons - 12 times/year

(2) Nitric Acid - 10 gallons - 4 times/year

(3) Cleaner - 200 gallons - 5 times/year

(4) Chromate cleaner - 15 gallons - 2 times/year

PLATING SHOP

Solution	Volume Gallons	No. of Dumps Per Year	pH	Alkalinity as $CaCO_3$	Cyanide as CN
Zinc Plating Tank	150	1	10.6	46,600	6,650
Electro-Cleaner	200	1	11.5	22,100	5

One other solution not sampled is the Copper plating tank - 150 gallons - once/year.

All roof drains and boiler blowdown also discharge to the storm sewer system. Sanitary sewers discharge to the municipal sanitary sewers.

DISCUSSION

The periodic dumping of the strong plating and pickling solutions to the storm sewer can lead to impairment of the receiving watercourse, namely the Otonabee River, as well as corrosion of the City storm sewers even though the volumes are small. Such discharges are also in violation of the City of Peterborough Municipal Sewer-Use By-Laws.

Although no samples were obtained of the plant wastes during normal operating conditions it can be expected that these also would exceed the By-Law limits for discharge to a storm sewer.

CONCLUSIONS AND RECOMMENDATIONS

The wastes from the plating and pickling areas of the plant are unsuitable for discharge to the City storm sewers. Alternative means of disposal and treatment must be considered for these wastes.

It is recommended that the Company determine the nature of the waste waters during normal operation in order that a system of waste disposal may be designed to adequately treat these wastes for discharge to the sanitary or storm sewers. It is recommended that the periodic dumping of the strong solutions be discontinued until some facilities to properly treat these dumps are provided.

PETERBOROUGH MUNICIPAL SURVEY - 1970

- NASHUA CANADA LIMITED -

SUMMARY

The wastes arising from wash-ups in the gum mixing and paper coating areas were found to be unsuitable for discharge to a storm sewer. It is recommended that these wastes be directed to the municipal sanitary sewers. They are of very low volume and of moderate strength and should not present any treatment problems in the City of Peterborough Sewage Treatment Plant.

DETAILS OF SURVEY

Operations at this plant involve the conversion of various types of rolled stock paper into a variety of labels, electrostatic copy papers, waxed papers and gummed papers. The processes in the plant are essentially dry and consist of gumming, printing, coating and cutting.

Water is used for breaking of the paper machines and wash-up purposes.in the gum mixing area and the coating area.

Officers of the Company

Mr. K. R. Hines - President

Personnel Interviewed

Mr. J. Hanley, Mechanical Superintendent

Mr. T. Braithwaite, Project Supervisor

Production and Operating Data

Employees - 180

Operating Schedule - 5-1/2 days/week

- 24 hours/day

Water Usage

All water is obtained from the municipal supply. Daily consumption is approximately 60,000 gallons of which 5,000 gallons is used for steam.

Sources of Wastewater and Disposal

Contaminated waste waters come from wash-ups in the gum mixing and paper coating area only. These wastes are of small volume but are not discharged to the sanitary sewer system.

Waste from the gum mixing area flow to a small sump in the floor which overflows to the plant roof drainage system. The wash-up from the coating machine is dumped to a small courtyard which drains to the storm sewers.

Roof drains and the water used for paper machine breaking is discharging to the storm sewer, with all sanitary wastes being directed to the municipal sanitary sewers.

Sampling, Analysis and Summary of Results

Grab samples were taken of the courtyard run-off and the gum mixing area sump on July 8, 1970. These were found to have concentrations of 550 ppm and 1,400 ppm of BOD_5 respectively. No wash-ups were being carried out at the time of the sampling. No estimate was made of the volume of water used for this purpose.

DISCUSSION

The waste streams sampled were found to be in excess of the OWRC objective of 15 ppm BOD_5 for discharge to a storm sewer or watercourse. Although these wastes are of higher concentration than outlined in the municipal By-Law, they are of low volume and therefore would represent an insignificant increase in the waste loading to the municipal sewage treatment plant. Also these wastes by their nature should be readily treatable in the treatment process.

CONCLUSIONS AND RECOMMENDATIONS

Wastes arising from the wash-ups in the gum mixing room and the machine coating area were found to be unsuitable for discharge to a storm sewer. It is recommended that these wastes be diverted to the municipal sanitary sewer in order that they may be adequately treated.

PETERBOROUGH MUNICIPAL SURVEY - 1970

- OUTBOARD MARINE CORPORATION - OF CANADA LIMITED

SUMMARY

The plant effluent to the municipal storm sewer was found to be acceptable for discharge to a watercourse. However, it is recommended that the high chromium concentration in the discharge to the municipal sanitary sewer be decreased.

DETAILS OF SURVEY

Personnel Interviewed

Mr. G. Vivian - Chief Metallurgist

Mr. C. Porter - Plant Engineer

Officers of the Company

Mr. T. P. McMillan - President and General Manager

Mr. F. R. Barrett - Vice-President of Production

Description of Plant and Processes

The Monaghan Street plant of Outboard Marine Corporation of Canada Limited in Peterborough produces two-cycle internal combustion engines, lawnmowers, chainsaws and outboard motors. Motors for snowmobiles are transferred to the Neal Drive plant. The plant also contains associated laboratories and engineering facilities.

Some of the operations performed at the plant are:

(1) Machine shop and metal forming operations

(2) Aluminum and magnesium alloy die-casting

(3) Internal combustion engine assembly and testing

(4) Metal degreasing, surface treatment and electroplating

(5) Painting

(6) Heat treatment

In the die-casting area, molten alloys are die-cast under pressure using large hydraulic presses. Malfunctions of equipment can cause loss of hydraulic oil and metal. The metal where possible is recovered for remelting. When this is not practical, it is taken to a dump. In the case of the hydraulic oil, large spills are recovered, filtered and re-used. Small drippings and spills are cleaned up using an oil absorbent and taken to the dump with the waste metal.

In the electroplating area, copper, zinc, nickle, tin and chromium plating are carried out. All wastes from this area are treated and then discharged to the municipal sanitary sewer.

Operations at the Neal Street plant are dry in nature.

Production and Operating Data

The plant operates 24 hours per day, 5 to 6 days per week. A total of 1,800 persons were employed at the time of the survey, including 400 at the Neal Drive plant.

Water Usage

The average water consumption during 1969 was approximately 530,000 gpd. All water for both sanitary and process purposes is obtained from the municipal water supply.

Sources and Disposal of Liquid Wastes

The plant sanitary and storm sewers are completely segregated.

The plant storm sewers discharge to a covered ditch running beneath the plant from west to east. This ditch eventually discharges to the Lansdowne Street storm sewer and finally to the Otonabee River via the Park Street storm sewer.

The storm sewer collects cooling waters, boiler blowdown, overflow from the outboard testing tanks, and the rinses from the power saw washer. Also at the time of the survey the phosphate wash solution from this area was being discharged but arrangements were being made to collect this for discharge to the sanitary sewage system.

The heat treatment wastes and all wastes from the Lyfanite area, except the chromate rinse, are discharged directly to the municipal sanitary sewer on Romaine Street. The chromate rinse is pumped to the chromium treatment facilities at the plating shop for treatment and is discharged with the treated plating wastes to the Romaine Street sanitary sewer. Spent chromate solutions from the washing machines are collected for treatment prior to discharge to the municipal sanitary sewer. The spent phosphate solutions as well as the water used in paint booths are also collected for discharge to the sanitary sewer.

Waste Flows and Loadings

The waste flows were not measured; however, estimates were provided by plant personnel. A summary of the waste flows, analytical results, and waste loadings is given in the following table:

SUMMARY OF WASTE FLOWS, LOADINGS AND ANALYTICAL RESULTS

	Total Effluent to Storm Sewer	Plating Shop Effluent	Heat Treat and Lyfanite Effluent	Total Effluent to Sanitary Sewer
Flow, gpd	84,000	28,800	36,000	64,800
pH	8.2	7.8	7.2	
BOD_5, ppm	5	20	8	
BOD_5, lbs/day	4.2	5.8	2.9	
Susp. Solids, ppm	10	120	35	
Susp. Solids, lbs/day	8.4	34.6	12.6	
Chromium as Cr, ppm	.05	16	.38	
Chromium as Cr, lbs/day	.04	4.6	.14	4.74
Nickel as Ni, ppm	-	.20	-	
Nickel as Ni, lbs/day	-	.06	-	.06
Zinc as Zn, ppm	-	5.8	-	
Zinc as Zn, lbs/day	-	1.7	-	1.7
Cadmium as Cd, ppm	-	.19	-	
Cadmium as Cd, lbs/day	-	.06	-	
Tin as Sn, ppm	-	0.0	-	
Tin as Sn, lbs/day	-	0	-	0
Cyanide as CN, ppm	.05	.22	.02	
Cyanide as CN, lbs/day	.04	.06	.01	.07
Phosphorus as P, ppm	.66	.14	6.6	
Phosphorus as P, lbs/day	.55	.04	2.4	2.44

DISCUSSION

Outboard Marine Corporation of Canada Limited has been engaged in the programme of diverting contaminated waste streams from the storm sewer to the sanitary sewer. Those streams needing treatment (the spent chromate solutions and chromate rinses) have been directed through the plating shop treatment facilities prior to discharge. With the implementation of this programme the quality of the storm sewer effluent has been substantially improved, and now meets OWRC objectives for discharge to a natural watercourse.

There was, however, at the end of the working day a noticeable milky discolouration of the storm sewer possibly originating from a washing machine and contributing to the relatively high phosphorus concentration. It was anticipated that complete diversion of the power saw washer to the sanitary sewer would solve this problem.

The discharges to the sanitary sewer are still high in chromium. This is due to the overloading of the settling stage of the plating waste treatment facilities. During the survey, it was evident that there was considerable carryover of suspended chromium floc which resulted in the high concentration in the discharge to the municipal sanitary sewer.

CONCLUSIONS AND RECOMMENDATIONS

The storm sewer effluent of Outboard Marine Corporation of Canada Limited was found to be satisfactory for discharge to a natural watercourse. It is recommended,however, that the Company cntinue in its

efforts to ensure that all contaminated waste streams be diverted to the municipal sanitary sewerage system.

In view of the high concentrations of chromium being discharged to the municipal sanitary sewer in the form of suspended matter, it is recommended that the Company improve the settling capabilities of the treatment facilities or replace the existing facilities with a more efficient solids removal system.

PETERBOROUGH MUNICIPAL SURVEY - 1970

OVALTINE FOOD PRODUCTS A DIVISION OF - THE A. WANDER COMPANY OF CANADA LIMITED -

SUMMARY

Liquid waste disposal practices at this plant were found to be generally satisfactory with all wastes discharging to the storm sewer meeting the OWRC objectives for discharge to a watercourse. In order to reduce the high waste load to the sanitary sewer system it is recommended that modifications be made to the waste mash disposal and the malt extract screening to reduce the amount of high strength wastes gaining access to the sewer.

DETAILS OF SURVEY

A preliminary visit was made to the plant on July 7, 1970, and a sampling survey was carried out on October 7, 1970. Mr. D. Smith, Plant Manager, supplied the necessary information.

Description of Processes

Malted barley and corn meal are ground mixed in varying proportions and brewed. The brew is then filtered and evaporated producing a viscous product called malt extract. This product is again filtered, packaged and sold or is further processed into "Ovaltine" or confectionary products.

Approximately nine brews are made per week. The plant operates 24 hours/day, 5 days/week, employing approximately 30 persons.

Water Sources, Uses and Disposal

Water is obtained both from the Peterborough PUC and two wells on the property. Approximately 200,000 gpd are purchased from the City while the wells supplying in the order of 430,000 gpd for cooling purposes. City water is used almost exclusively for steam and hot water production, and wash-ups.

Well water is pumped to a reservoir from where it is distributed throughout the plant. Water used in the surface condensers for the vacuum ovens, and the air conditioning equipment is recirculated to the well water reservoir. Overflows from the reservoir are directed to the municipal storm sewer. The principal use for well water is in the three barometric leg condensers which discharge to the storm sewer.

All in-plant drains and the yard drains in the vicinity of the spent mash bin are connected to the municipal sanitary sewer system.

Sampling, Analysis and Waste Loadings

A total of five samples were obtained. These were:

(1) Total plant discharge to the Park Street storm sewer - Composite

(2) Total plant discharge to the municipal sanitary sewer - Composite

(3) Barometric leg condenser discharge to storm sewer - Composite

(4) Non-condensables discharged to sanitary sewer - Grab

(5) Drippings from spent mash bin - Grab

A summary of the analytical results and estimated loadings is given below:

	Estimated Flow	BOD_5		Susp. Solids	
	gals/day	ppm	lbs/day	ppm	lbs/day
Total Discharge to Storm Sewer	430,000	2.0	8.6	5	21.5
Total Discharge to Sanitary Sewer	50,000	2,200	1,100	690	345
Barometric Leg Discharge	300,000	8.0	24	10	30
Non-Condesnables Discharge	1,000	150	1.5	70	0.7
Spent Mash Bin Drippings	500	16,000	90	500	2.5

As it was not possible to obtain accurate flow data, particularly in the case of the wastes discharged to the sanitary sewer, the calculated loadings are only approximations. The analytical results however do indicate the sources of strong wastes.

CONCLUSIONS AND RECOMMENDATIONS

The liquid waste disposal practices at this plant appear to be generally satisfactory. All waste effluents to the storm sewer meet OWRC objectives for discharge to a watercourse. The waste discharge to the sanitary sewer exhibited a BOD_5 concentration in excess of that set down in the municipal sewer-use by-law.

The main sources of BOD_5 were the drippings from the spent mash bin and the washings from the nozzle-shaped fine screens used for filtering the concentrated malt extract. Considerable amounts of the malt extract

were lost to sewer during this process. This waste, though not sampled, is thought to be a significant contributor to the plant waste load.

In order to reduce loadings to the sewer, it is recommended that the spent mash bin be sealed to prevent leaks, and that the excess liquid be hauled with the spent mash. It is also recommended that investigations be made into the possibility of modifying the cleaning procedure for the screens to reduce losses.

PETERBOROUGH MUNICIPAL SURVEY - 1970

- THE PETERBOROUGH PLATING COMPANY LIMITED -

SUMMARY

The waste concentrations in the plant effluent were found to be relatively low. This may be due in part to the higher than normal waste volumes. In order to prevent serious spills of plating solutions from entering the sewer system, the placing of curbing around these tanks or other suitable methods of spillage control should be initiated.

DETAILS OF SURVEY

The main operations consist of buffing and plating of metal parts.

The main sources of wastes are the nickel and chromium plating operations. A copper plating tank is used infrequently, while an existing zinc barrel-plating line is no longer in use.

Personnel Interviewed

Mr. A. Madill, President

Production and Operating Data

Number of Employees: 5

Operating Schedule: 8 hrs/day, 5 days/week

Water Usage

Water is obtained from the municipal PUC and a private well. The average water usage during 1969 is 10,000 gpd from the PUC and approximately 12,000 gpd from the private well.

The total average usage is 22,000 gpd.

Sources of Waste Waters and Disposal

All waste waters originate from the overflow of the various running rinse tanks. These all overflow to a common trench and discharge to the City sanitary sewer along with the sanitary sewage from the plant.

Sampling and Analysis

A half-hourly composite sample of the plant effluent was obtained on October 6, 1970, over a period of 2-1/2 hours. The plating line was operating near capacity at that time, with both nickel and chromium plating being carried out. Samples obtained for cyanide analysis were preserved with sodium hydroxide pellets.

The analytical results are summarized below:

Waste Stream	Concentration, ppm				
	Zinc as Zn	Chromium as Cr	Nickel as Ni	pH	Cyanide as CN
Chromium Cold Water Rinse	-	9.5	-	7.7	-
Nickel Cold Water Rinse	-	-	2.3	7.6	-
Total Plant Effluent	0.34	0.7	3.3	7.6	0.29

DISCUSSION OF RESULTS

The concentrations of chromium and nickel in the plant effluent were found to be lower than expected for a plant without any treatment. This can possibly be attributed to the high water usage for the size of the operation.

Despite the use of drag-out tanks and drip trays there was considerable splashing of concentrated plating solutions onto the floor, particularly in the case of the nickel tank. This drained to the floor trench, and may explain why the total plant effluent contains a higher nickel content than the nickel cold water rinse.

CONCLUSIONS AND RECOMMENDATIONS

The concentrations of chromium and nickel in the plant effluent to the sanitary sewer were found to be relatively low.

None of the plating tanks are curbed. Thus a serious leak or rupture of any of the tanks would result in a shock load of plating wastes at the sewage treatment plant and a possible plant upset. For this reason, it is recommended that facilities such as curbing be provided to prevent losses of the solutions to the sewer. It is also recommended that alterations be made to prevent splashing of concentrated plating chemicals onto the floor.

PETERBOROUGH MUNICIPAL SURVEY - 1970

- QUAKER OATS COMPANY OF CANADA LIMITED -

The Company manufacturers cereal products. The concentrations of BOD_5 and suspended solids in the plant effluent are in excess of the City By-Law requirements. The contaminated waste volume, however, is small. The main sources of high strength wastes are the effluents from the corn washer and muffet cookers.

DETAILS OF SURVEY

Description of Process

Corn is washed to remove dust and other contaminants prior to being milled. Oats and corn are milled and blended with wheat flour, to produce the various hot and cold cereal mixtures which are cooked and packaged.

The plant operates 5 days/week and employs 310 people. Some processing operations run 24 hrs/day. Milling operates 16 hrs/day and packaging 8 to 16 hrs/day as needed.

Water Sources, Usage and Disposal

All of the process water for the plant is obtained from the Peterborough PUC. The estimated total water usage for processing is 14,000 gals/day based on usage during the survey period. Most of this water is discharged to the municipal sanitary sewer.

..... 50

It is estimated that 9,000 gpd of water is used in washing the corn and approximately 1,500 gpd is used in the muffet cooking operation. Most of the remaining water is used to wash machinery and clean floors.

In addition, an undetermined amount of water is obtained from the river and used as cooling water for compressors and the air conditioner. The uncontaminated cooling water is returned to the river.

Sampling, Analysis and Waste Loadings

Composite samples of the various effluents were obtained on September 14, 1970. Results of the analysis of the samples are shown as follows:

WASTE CONCENTRATIONS AND LOADINGS

(Total estimated Waste Flow = 14,000 gpd)

	Concentrations, ppm				Loadings, ppm		
Effluent Stream	BOD_5	Susp. Solids	Diss. Solids	Ether Solubles	BOD_5	Susp. Solids	Diss. Solids
Corn Washer Effluent - 9,000 gals/day	550	320	290	-	49.5	28.7	26
Muffet Cooker Effluent - 1,500 gals/day*	13,000	11,600	5,800	-	195	174	87
Wash Tank - 200 gals/month	3,000	1,100	4,220	-	-	-	-
Oil Separation Tank (effluent volume unknown)	2,400	920	3,700	255	-	-	-
Machine Washing and Clean-up - volume unknown	-	-	-	-	-	-	-

* 900 gals/day effluent + 600 gals/day dump

Since it was not possible to obtain accurate samples or volume measurements of the water being used for washing, total loadings are difficult to determine for this industry. The loadings are probably slightly in excess of 245 lbs/day of BOD_5 and 104 lbs/day of suspended solids from corn washing and muffet cooking. In general, the concentrations of contaminants in the wash water should not exceed 300 ppm BOD_5 and 300 ppm suspended solids while the volume of water passing through the oil separator is probably in the order of 500 gals/day. Under these conditions the additional loadings due to wash-up and oil separation would be in the order of 25 lbs/day BOD_5 and 15 lbs/day suspended solids.

CONCLUSIONS

With waste loadings in the order of 270 lbs/day BOD_5 and 120 lbs/day suspended solids in 14,000 gpd of wastewater, the BOD_5 and suspended solids concentrations in the effluent are approximately 1,900 ppm and 850 ppm respectively. These concentrations are in excess of the City By-Law limits. The contaminated waste volume, however, is small.

PETERBOROUGH MUNICIPAL SURVEY - 1970

- RAYBESTOS-MANHATTAN (CANADA) LIMITED -

SUMMARY

Both plant outfalls to the Crawford Drive storm drain were found to be unacceptable for discharge to a watercourse. It is recommended that the Company effectively eliminate the discharges of lead and zinc from the plant and also provide oil removal facilities.

DETAILS OF SURVEY

A series of composite and grab samples were obtained on October 5 and 6, 1970. During the survey, the plant was reported to be operating normally.

Officers of the Company

Mr. J. S. Munro - President

Mr. G. E. McMullen - Vice-President of Manufacturing

Mr. C. R. Phillips - Vice-President of Engineering

Personnel Interviewed

Mr. C. R. Phillips - Vice-President of Engineering

Mr. M. Perry - Project Supervisor

Mr. A. C. Knott - Plant Engineer

Description of Process

Both poled and mandrelless industrial rubber hose are manufactured. Raw materials consist of a variety of oils, clays, carbon blacks and synthetic and natural rubbers.

.....53

In the manufacture of poled hose, the required layers of rubber and fabric are applied to the long cylindrical mandrel. These are then placed in a steam treated vulcanizer for curing. At the end of the cure the mandrels are removed from the vulcanizer, the hose withdrawn, and cut or coiled for shipment.

In the case of the mandrelless tubing, a hollow tube of uncured rubber and fabric layers is formed. This hose is then fed into a lead extruder where a cylinder of lead is formed around the rubber. At the same time water is injected under pressure into the hose. The lead-sheathed hose is then coiled on large reels and placed in a large steam heated vulcanizer. At the end of the cure, cold water is sprayed onto the coils while inside the vulcanizer. The coils are then removed, the water inside the hose allowed to drain and the lead sheath removed by machine. The finished hose is then coiled for shipment.

A second plant on Perry Street manufactures brake linings and clutch facings. These operations are essentially dry.

Operating Data

Number of Employees: 125

Operating Schedule: 5 days/week, 16 hours/day - poled and 8 hrs/day - mandrelless

Water Usage and Disposal

All water is obtained from the Peterborough Public Utilities Commission. Total water consumption during 1969 averaged approximately 82,500 gallons daily.

All sanitary wastes are discharged to the municipal sanitary sewers. All other wastes, including roof and floor drains, discharge to the

storm sewers.

Normal water usage was measured using the plant water meter during the survey and found to be approximately 9,000 gals/hr. This, however, did not include the cooling water for the large vulcanizer. It was estimated that an additional 10,000 gallons would be used daily for this purpose, based on present production. This could be expected to approach 25,000 gallons at full production.

Wastes are discharged from the plant through two sewers, the East and West Storm Sewers. The West Storm Sewer serves the poled hose manufacturing area and was estimated to have a flow of approximately 30 gpm at the time of the survey. Wastes discharging through this sewer included vulcanizer condensates and cooling waters from the rubber compounding area. The East Storm Sewer was estimated to have a flow of approximately 75 gpm and included all wastes from the mandrelless hose manufacturing area. Most wastes from this area were cooling waters except for condensate from the large vulcanizer and an overflow from a zinc sterrate coating operation in the hose forming area. Sumps containing hydraulic equipment also drain to this sewer.

Sampling and Analysis

Composite samples were obtained from the East and West Storm Sewers, the poled hose vulcanizer, the mandrelless hose (large) vulcanizer, and the lead extruder cooling water. Grab samples were obtained of the large vulcanizer cooling water, the East Storm Sewer during discharge of this

cooling water, and surface and bottom samples from the ditch in the vicinity of theEast Storm Sewer outfall.

The following is a summary of the results.

	BOD_5		Lead as Pb		Zinc as Zn		Susp. Solids		Flow
	ppm	lbs/day	ppm	lbs/day	ppm	lbs/day	ppm	lbs/day	GPD
West Storm Sewer	38	11	-	-	-	-	35	11	29,000
East Storm Sewer	-	-	.12	.06	.40	.20	20	10	50,000
Lead Extruder Cooling Water	-	-	0.80	.04	-	-	-	-	5,000
West Vulcanizer Condensate	160	.8			---	-	5	.03	500
East Vulcanizer Condensate	-	-	15.2	.02	-	-	30	.03	100
East Vulcanizer Cooling Water	-	-	3.9	.39	-	-	10	1.0	10,000
Bottom Sediment at East Storm Sewer Discharge	-	-	610	-	27.8	-	-	-	-

Oil in the sample obtained from the surface of the water in the vicinity of the East Storm Sewer was characterized by the OWRC Laboratories in Toronto as a paraffinic base petroleum hydrocarbon, possibly a lubtricating oil. All other tests were also carried out at the OWRC Laboratories in accordance with the procedures described in "Standard Methods for the Examination of Water and Wastewater", 12th edition.

DISCUSSION OF RESULTS

The discharge of small amounts of lead, most of which is likely in an undissolved form, has given rise to an accumulation of lead in the bottom of the drainage ditch in the vicinity of the East Storm Sewer. An accumulation of zinc was also found. This contaminated area was excavated late in December, 1970.

The amount of lead measured in the final outfall does not equal that found at the individual sampling locations within the plant. This can be attributed to sampling error, particularly if the lead is in a solid or undissolved form. The settled lead could move along the bottom of the sewer and thus not be sampled.

It should also be noted that the large vulcanizer was only loaded to 40% capacity during the run that was sampled. Thus the loadings for each normal full capacity may be in the order of twice that calculated from the samples taken.

It was reported that approximately 300 lbs. of lead are lost annually from this plant. It was not known whether all of this was lost to sewer. However, based on the samples taken, the loss of lead by way of the Large Vulcanizer Cooling Water is approximately 0.4 lbs/day or in the order of 125 lbs/year.

CONCLUSIONS AND RECOMMENDATIONS

Both plant outfalls to the Crawford Drive Storm Drain were found to be unacceptable for discharge to a natural watercourse. The West

Storm Sewer contained excessive BOD_5 and suspended solids concentrations. The East Storm Sewer was found unacceptable due to oil, lead, and zinc contamination.

The Company has been studying the problems in the East Storm Sewer with the aim of providing treatment of the wastes and have had the drainage ditch in the area of that outfall excavated. It is recommended that the Company treat the effluent from this sewer or modify in-plant processes such that the discharge of lead and zinc are effectively eliminated and to provide adequate oil removal facilities.

PETERBOROUGH MUNICIPAL SURVEY - 1970

- SARGENT HARDWARE OF CANADA LIMITED -

SUMMARY

This plant assembles locks, door closures and panic bars. Industrial liquid wastes originate from the plating operation. At present, the Company has reduced the contaminant concentrations in the effluent to acceptable levels for discharge to the municipal sanitary sewer, and, in the future, will discharge the plating wastes to the municipal sewer.

DETAILS OF SURVEY

Plant Operations and Operating Data

Brass, Bronze, Aluminum and Stainless Steel parts are imported, finished, and assembled into locks, door closurers, and panic bars.

The plant operates 8 hrs/day, 5 days/week and employs 55 people in the plant and 22 people in the office. The plating area normally operates 8 hrs/day but the type of plating varies from day to day with type of finish required for production.

Water Sources, Usage and Disposal

Water for the plant is supplied by the PUC. Water usage for the plating operation is estimated to be 7,000 gpd based on usage at the time of the survey. The water is used in running rinses and the waste-water generated is discharged to a gravel bed and weeping tile system.

..... 59

Sampling, Analysis and Waste Loadings

Composite samples of the plating area effluent were obtained on October 7, 1970. Results of the analysis of the samples are shown below:

WASTE CONCENTRATION

(Waste Flow = 7,000 gpd)

Contaminant	Concentration (ppm)
Copper	0.18
Nickel	1.3
Chromium	.14
Cyanide	0.25

The low concentration of the contaminants reflect the Company's installation of drip racks and mist sprayers to reduce plating solution losses. Prior to these modifications the chromium concentration was 4 to 6 ppm.

CONCLUSIONS

While the Company has reduced the concentrations of the contaminants in the effluent, discharge to a weeping tile system is still unsatisfactory. On the day sampled the nickel concentration was higher than the OWRC objective for discharge to a natural watercourse.

The Company is presently involved in installing the piping and pump to discharge the plating effluent to the municipal sanitary sewer. Upon completion of this connection, waste disposal at this plant will be satisfactory.

PETERBOROUGH MUNICIPAL SURVEY - 1970

- SILVERWOOD INDUSTRIES LIMITED -

This plant produces bottled milk, ice cream and evaporated milk. The main sources of wastewater are bottle, tank and line rinsing and washing. Cooling water should be diverted from the sanitary sewer to the storm sewer.

DETAILS OF SURVEY

Plant Operations and Operating Data

Raw milk is received in bulk, and processed into bottled milk, ice cream, and evaporated milk. During the survey period, about 53% of the milk was processed into fluid milk products, 35% into ice cream and 6% into evaporated milk. The remaining 6% was sold in bulk to other milk plants.

The plant operates 8 hrs/day, 5 days/week and employs 50 - 65 people. An additional 60 people are employed in the office or as truck drivers.

Water Sources, Usage and Disposal of Wastewater

Water is obtained from the PUC and from a private well located on plant property. Approximately 180,000 gpd of water are obtained from the well for cooling purposes in heat exchangers and compressors, while 140,000 gpd are obtained from the PUC for use mainly as wash water. At present, all wastes are discharged to the municipal sanitary sewer.

Sampling and Analysis and Waste Loadings

Composite samples of the various plant effluents were obtained on July 23, and September 3, 1970. Average results of the analyses are listed as follows:

WASTE CONCENTRATIONS AND LOADINGS

Waste Flow (Total) = 320,000 gpd

Effluent	Concentrations (ppm) BOD_5	Concentrations (ppm) Susp. Solids	Loadings (lbs/day) BOD_5	Loadings (lbs/day) Susp. Solids
Cooling Water 180,000 gpd	1.4	8	-	-
Bottle Washer 32,000 gpd	3.2	50	-	16.0
Wire Crate Washer 1,200 gpd	6.5	20	-	-
Milk Tanks and Trucks 1st Rinse - 6,000 gpd	2,500	1,050	150	63
Line Rinse 3,000 gpd	260	60	7.8	1.8
Ice Cream Tank 1st Rinse - 10 gpd	460,000	200,000	46	20
Evaporator Milk Tanks 1st Rinse - 100 gpd	13,400	2,520	13.4	2.5
1st Wash - 100 gpd	1,900	1,400	1.9	1.4
TOTAL			224	104.7

The BOD_5 loading from the samples taken is calculated to be 224 lbs/day. A minor additional loading results from other wash-up operations which could not be easily sampled. As a check on this loading, a projected waste loading based on milk intake figures is listed below:

Process	Estimated BOD_5 Loading lbs/day
Receiving and Cooling	68
Tank Truck Delivery and Washing	17
Storage	8.5
Milk Pasteurization	72
Ice Cream Making	24
Cream Separation	68
Evaporation	3
TOTAL	260 lbs/day

The data for the above table was taken from "An Industrial Waste Guide to the Milk Processing Industry", a United States Public Health Publication.

CONCLUSIONS AND RECOMMENDATIONS

In general, the plant operates in a clean and efficient manner which keeps accidental spills to a minimum. It would appear that little can be done to reduce the plant loading but a large reduction in the volume of water discharged to the municipal sanitary sewer can be made. It

is recommended that all of the uncontaminated cooling water which is presently discharged to the sanitary sewer be discharged to a storm sewer. The Company has been informed of this and plant personnel have indicated that the cooling water will be redirected during the installation of additional heat exchangers in 1971.

PETERBOROUGH MUNICIPAL SURVEY - 1970

- WESTCLOX - DIVISION OF GENERAL TIME OF CANADA LIMITED -

SUMMARY

The industrial liquid wastes from this plant include rinse waters from the plating room and cooling water from the air compressors. The plating wastewater is discharged to the municipal sanitary sewer and the uncontaminated cooling water is discharged to the Otonabee River. The concentrations of contaminants in the total plant effluent should be satisfactory for discharge to the sanitary sewer.

DETAILS OF SURVEY

Plant Operations

The basic operations carried out in the plant include the manufacture, plating and assembly of clock parts. 75% to 80% of the parts used in the assembled clocks are manufactured at the plant. In addition to clocks, computer keyboards are assembled.

The plant operates 8 hrs/day, 5 days/week and employs 520 people. In the plating room, nickel plating takes place each day while zinc and chromium plating are carried out only two or three days per week. Cadmium and copper plating take place infrequently.

Water Sources, Usage and Disposal

All of the water for plating, cooling and domestic use (110,000 gpd) is obtained from the PUC. Water used for cooling the compressor is

..... 65

discharged to a storm sewer leading to the Otonabee River while the plating and domestic waste waters are discharged to the municipal sanitary sewer. The plating room wastes are collected and discharged to the sewer separate from domestic waste waters. The waste waters from the plating room are estimated to be 60,000 gpd based on usage during the survey period.

Sampling, Analysis and Waste Loadings

Composite samples of the total effluent from the plating room wereobtained on August 25 and October 23, 1970. On August 25, nickel and zinc plating were taking place, and on October 23, nickel, copper, cadmium and zinc were being plated. Results of the analysis of the samples are as follows:

WASTE CONCENTRATIONS AND LOADINGS

(Waste Flow = 60,000 gals/day)

Component	Concentration (ppm)		Loadings (lbs/day)	
	August 25	October 23	August 25	October 23
Nickel	0.43	0.40	.21	.20
Zinc	0.96	0.73	.48	.37
Cyanide	0.7	-	.09	-
Copper	0.09	1.77	.05	.89
Cadmium	0.09	.48	.05	.24
pH at Lab	7.9	7.6		

As shown in the above table, waste loadings vary from day to day due to the intermittent nature of some of the plating operations.

CONCLUSIONS

The concentrations of metal ions in the plant effluent are below levels considered satisfactory for discharge to a municipal sewerage system.

PETERBOROUGH MUNICIPAL SURVEY - 1970

- G. WHITAKER AND COMPANY LIMITED -

SUMMARY

All wastes from the plant are discharged to the municipal sanitary sewer. The waste waters have high BOD_5, suspended solids and ether solubles concentrations, but are readily treatable in the municipal sewage treatment plant.

DETAILS OF SURVEY

Plant Operations and Operating Data

The plant scours domestic and imported wool to remove grease, lanolin and dirt. The grease wool is washed in a series of four tanks with hot water and detergent in the first two and hot water only in the final two. The scoured wool is dried with hot air and stored for shipment to manufacturers.

At present, the plant employs 11 people and operates 8 hrs/day, 5 days/week. Scouring is done 8 hrs/day, 2 days/week at present, but could expand to 5 days/week in the future.

Water Sources, Usage and Disposal

Approximately 4,000 gpd of water are supplied by the PUC. The waste waters from scouring are discharged to the municipal sanitary sewer after being screened to remove wool fibres.

Sampling, Analysis and Waste Loadings

A composite sample of the plant effluent was collected on October 8, 1970, together with grab samples taken at the end of the day from each of the scouring tanks. The results of analysis represent the maximum concentrations since the dirtiest type of wool was being scoured. Further grab samples were taken from the scouring tanks on October 22, 1970.

TABLE I

WASTE CONCENTRATIONS AND LOADINGS

Effluent Stream	Concentration (ppm)					Loadings (ppm)				
	BOD_5		Suspended Solids		Ether Solubles	BOD_5		Suspended Solids		Ether Sol.
	OCT. 8	OCT. 22	Oct. 8	Oct. 22	Oct. 8	Oct. 8	Oct. 22	Oct. 8	Oct. 22	
Total Plant Effluent 3,400 gals/day	1,300	-	1,130	-	720	44.2	-	38.4	-	24.4
Tank #1 * 220 gals/day	20,000	12,000	22,400	22,250	-	44	26.5	49.4	48.8	-
Tank #2 * 180 gals/day	4,200	2,000	7,300	2,350	-	7.6	3.6	13.0	4.3	-
Tank #3 * 130 gals/day	1,800	800	3,700	840	-	2.4	1.0	4.8	1.1	-
Tank #4 * 130 gals/day	600	280	2,100	270	-	.8	.4	2.7	.4	-
TOTAL						99		108.3		

* Dumped at the end of the day

Comparing the results of samples taken on October 8 and October 22, it can be seen that the concentrations were much lower on October 22. This was expected since the dirtiest wool was being scoured on October 8. The dirtier wool is washed approximately 5% of the time and creates the maximum waste loading which are estimated to be 100 lbs/day BOD_5, 110 lbs/day suspended solids and 30 lbs/day ether solubles. The normal loading from the plant is estimated to be approximately 55 lbs/day BOD_5, 65-70 lbs/day suspended solids and 25 lbs/day ether solubles. The ether solubles concentrations result from the grease and lanolin removed from the wool during scouring.

CONCLUSIONS

The concentrations of contaminants in the waste waters from this plant are in excess of the Peterborough By-Law requirements. This high concentration waste should be readily treatable in the sewage treatment plant. One source* indicates that wool scouring wastes will receive adequate treatment in a sewage treatment plant as long as the wastes are diluted at least 1:40 with domestic sewage.

* Pitra, A., Biological Treatment of Wool Scouring Wastes, Journal of Water and Waste Treatment July/August 1967.

PETERBOROUGH MUNICIPAL SURVEY - 1970

- MINOR WET INDUSTRIES -

The industries which were found to have relatively minor waste flow and loadings are listed below:

Coca-Cola Limited

Minit Car Wash

Moncrief's Dairy

Mohan-Hunter Dairy

With the exception of the Mohan-Hunter Dairy, the above Companies dispose of their wastes in a satisfactory manner.

The Mohan-Hunter Dairy discharges its wash water to a municipal storm sewer. While the waste volume and loadings are relatively minor, discharge to a storm sewer is an unacceptable practice. This situation arose since the plant is located below the level of the sanitary sewer. Thus, plugging or overloading of the sanitary sewer could cause sanitary wastes to enter the dairy. It is recommended that a special check valve be installed, and the plant wash waters be directed to the municipal sanitary sewer. This would remove daily wastes from the storm sewer and protect against spills.

The remaining industries, Coca-Cola Limited, Minit Car Wash, and Moncrief's Dairy, discharge a total of approximately 50,000 gpd to the sanitary sewer. The wastewater from both Coca-Cola and Moncrief's is from bottle and equipment washing operations. Waste waters from

Minit Car Wash are first pretreated in settling tanks to remove suspended solids and then discharged to the municipal sanitary sewer.

In general, it was determined during the preliminary visits that the above industries have relatively minor waste loadings.

PETERBOROUGH MUNICIPAL SURVEY - 1970

APPENDIX A

SIGNIFICANCE OF WASTE CHARACTERISTIC
AND
ANALYTICAL RESULT TERMINOLOGY

1. BOD_5 ..... The biochemical oxygen demand or BOD is an indication of the quantity of oxygen required by biological processes in natural waters or sewage treatment plants to stabilize or render inert the organic material contained in the wastewater tested. It is therefore a measure of the pollutional effect of effluents containing essentially organic wastes.

2. COD ..... The chemical oxygen demand or COD is an indication of the oxygen required to stabilize or render inert all oxidizable materials, including those measured in the BOD_5 test, contained in the wastewater tested. It is particularly applicable to inorganic industrial wastes or those organic wastes which are difficult to stabilize by biological processes.

3. Total Solids ..... Total solids is a measure of the total of the dissolved and suspended solids contained in the water tested.

..... 74

4. Dissolved Solids .... Dissolved solids are essentially those solids which are in solution in the wastewater.

5. Suspended Solids .... Suspended solids are those solids which are filtered from the wastewater by a standard laboratory method. A high concentration of suspended solids can result in the clogging or blocking of sewers and in an extreme case can create problems in some sewage treatment plants.

6. pH ..... The pH of a solution is a measure of its acidity or alkalinity. A pH of 7 represents a neutral solution. As the pH decreases from 7, the acidity of the solution increases. Increasing pH's above 7 indicate an increase in alkalinity. Wastewaters having a pH considerably above or below 7 can result in accelerated corrosion of sewer lines, precipitation of solids in the sewer lines or treatment plants and in extreme cases, can upset biological processes in sewage treatment plants containing secondary treatment facilities.

7. Ether Solubles ..... The ether solubles test measures the amount of oil and grease-like material in the wastewater. Excessive quantities of these materials can block sewer lines and affect secondary sewage treatment

facilities and have serious aesthetic and biological effects when discharged to natural watercourses.

8. Phenols ..... This test measures the concentration of phenol and phenol-like materials in the wastewater. Phenols, even in minute concentrations, impart an unpleasant taste to water which is accentuated on chlorination. The presence of phenols in water is often an indication of industrial pollution.

9. Cyanide ..... The cyanide test indicates the presence of the cyanide ion. Under acid conditions, cyanide compounds produce hydrogen cyanide which is extremely toxic to humans. Cyanides are associated with industrial wastes such as those from metal hardening and plating processes.

10. Sulfates ..... Sulfates, when combined with the calcium and magnesium in water, form precipitates which can cause scale build-up on sewer lines.

11. Metals ..... Many metallic ions are toxic to biological processes whether they occur in natural watercourses or secondary sewage treatment plants. Some are toxic to higher forms of animal life, such as fish, when present in the animals habitat. Some

metals, such as iron, are reported to have a beneficial effect on sewage. The metallic ions usually considered to be most toxic are: copper, chromium, nickel, lead, cadmium, zinc. Other metallic ions, such as silver, gold cobalt, manganese and tin, normally do not have harmful effects in the concentrations usually found in industrial wastes.

APPENDIX B

PETERBOROUGH MUNICIPAL SURVEY - 1970

INDUSTRIES WITHOUT LIQUID WASTES

The following is a list of industries which were found to have negligible liquid wastes or which were discharging wastes of an acceptable nature (e.g. uncontaminated cooling water) to storm sewer, drainage ditches or natural watercourses.

COMPANY	TYPE OF INDUSTRY	WASTES	WASTE DISPOSAL
Becker Milk Co. Ltd.	Retail and Wholesale outlet for dairy products which have been packaged elsewhere	Sanitary only	Septic tank
Boorman's Beverages	Warehouse and Distribution Centre for Pepsi and Canada Dry	Sanitary only	Municipal San. Sewer
Dominion Dairies Ltd.	Milk Products Dist. Centre	Sanitary	Septic Tank
Domtar Packaging Ltd.	Cardboard box manufacturing	Sanitary Boiler Blowdown	Municipal San. Sewer Yard
Ethicon Sutures Ltd..	Manufacturing of Medical Supplies such as Surgical Sutures	Sanitary only	Municipal San. Sewer
Fisher Gauge Ltd.	Zinc die casting and manufacturing of zinc die cast machines	Sanitary only	Municipal San. Sewer
Foldaway Furniture Ltd.	Cupboard and Cabinet Manufacturing	Sanitary only	Municipal San. Sewer
Luminous Process Ltd.	Radiluminous Processes	Sanitary only	Municipal San. Sewer
Milltronics Limited	Electronics	Sanitary only	Municipal San. Sewer
Peterborough Lumber Co. Ltd.	Carpentry, retail store, lumberyard	Sanitary only	Municipal San. Sewer
Purity Packaging Ltd.	Paper products	Sanitary Cooling water	Municipal San. Sewer Municipal Storm Sewer
Tilco Plastics Ltd.	Injection molding of plastic	Sanitary Cooling water	Municipal San. Sewer Municipal Storm Sewer

..... 78

APPENDIX C

PETERBOROUGH MUNICIPAL SURVEY - 1970

WET INDUSTRIES

INDUSTRIAL WATER USAGE, WASTE FLOWS AND BOD_5 LOADINGS (NOTE: In terms of MGD and lbs/day, day refers to an operating day in the industry concerned)

COMPANY	OPERATING SCHEDULE DAYS/WK	HRS/DAY	WATER USAGE MGD SOURCE PUC	PRIVATE	ESTIMATED WASTE FLOW SAN. SEWER	OTHER POINTS	BOD_5 LOADING SAN. SEWER	COMMENTS
Brinton Carpets Limited	5	8 and 16	.062	-	.062	-	269	High BOD_5 concentration
Canadian General Electric	5	10 and 24	1.2	.30	.300	1.2	-	High phenol concentrations in storm sewer
Checkerboard Farms	5	8	.110	.-	.109	-	900	
DeLaval Co. Ltd.	5	8 and 16	.044	-	-	.044	-	Strong Chemical wastes to storm sewer
Nashua Can. Ltd.,	5-1/2	24	.060	.-	.005	.055	-	Some floor drains to storm sewer
Outboard Marine	5 - 6	24	.150	-	.065	.084	8.7	Improvement of chrom. removal
Ovaltine Food Products	5	24	.050	.430	.050	.430	1100	
Peterborough Plating Co. Ltd.	5	8	.010	.012	.022	-	-	
Quaker Oats Co. of Can. Ltd.	5	8 and 16	.015	-	.015	*	245	
Raybestos Manhattan Canada Limited	5	8 and 16	.083	-	-	.082		Lead and zinc and oil to storm sewer
Sargent Hardware of Canada Ltd.	5	8	.007	-	-	.007	-	
Silverwood Ind. Ltd.	5	8	.140	.180	.320	-	260	Cooling water discharge to the sanitary sewer
Westclox - Div. of General Time of Can. Ltd.	5	8	.110	-	.060	.050	-	
F. Whitaker and Co. Ltd.	2	3	.004	-	.004	-	55	High BOD_5 and Suspended Solids concentrations

* Unknown volume of cooling water

APPENDIX D

PETERBOROUGH MUNICIPAL SURVEY - 1970

Wet Industries - Personnel Interviewed

COMPANY	PERSONNEL INTERVIEWED
Brinton Carpets Limited	Mr. A. Bell, Plant Manager Mr. F. J. Heatley, Plant Engineer
Canadian General Electric	Mr. P. Hoes, Superintendent Plant Engineering
Checkerboard Farms	Mr. G. Morris, Manager
Coca-Cola Limited	Mr. J. Conlin, Plant Superintendent Mr. V. C. Ward, Manager
DeLaval Company Limited	Mr. J. J. Toth, Plant Engineer
Minit Car Wash	Mr. C. Sharpe, Manager
Moncrief's Dairy	Mr. G. Moncrief, Partner
Nashua Canada Limited	Mr. J. Hanley, Mechanical Sup't.
Outboard Marine	Mr. G. Vivian, Chief Metallurgist
Ovaltine Food Products	Mr. D. Smith, Plant Manager
Peterborough Plating Co. Ltd.	Mr. A. Madell, President
Quaker Oats Co. of Can. Ltd.	Mr. A. J. Bonney, Chief Engineer Mr. Sawfield, Plant Manager Mr. D. Whittaker, Plant Engineer
Raybestos Manhattan (Can.) Ltd.	Mr. C. R. Phillips, Vice-President of Engineering Mr. M. Perry, Project Supervisor
Sargent Hardware of Canada Ltd.	Mr. Campbell, President Mr. Metcalfe, Plant Superintendent
Silverwoods Industries Ltd.	Mr. H. K. Follis, Manager Mr. G. B. Coomba, Plant Superintendent
Mohan-Hunter Dairy	Mr. Rex Bunting, Operator
Westclox, Division of General Time of Canada Limited	Mr. Armstrong, Operation Manager Mr. Harvey, Manufacturing Superintendent
G. Whitaker and Co. Ltd.	Mr. K. M. Hanbidge, General Manager

PETERBOROUGH MUNICIPAL SURVEY - 1970

APPENDIX E

MUNICIPAL SEWER-USE BY-LAW

BY-LAW NUMBER 1955-14.

A BY-LAW TO PROHIBIT AND REGULATE THE DISCHARGE OF ANY GASEOUS, LIQUID OR SOLID MATTER INTO LAND DRAINAGE WORKS, PRIVATE BRANCH DRAINS AND CONNECTIONS TO ANY SEWER, SEWER SYSTEM OR SEWAGE WORKS FOR THE CARRYING AWAY OF DOMESTIC SEWAGE OR INDUSTRIAL WASTES OR BOTH, WHETHER CONNECTED TO A TREATMENT WORKS OR NOT.

PASSED THE 7th DAY OF FEBRUARY, 1955.

THE CORPORATION OF THE CITY OF PETERBOROUGH BY THE COUNCIL THEREOF ENACTS AS FOLLOWS:

SECTION I

DEFINITIONS

Unless the context specifically indicates otherwise, the meaning of terms used in this by-law shall be as follows:-

(a) "B.O.D." (denoting Biochemical Oxygen Demand) shall mean the quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure in 5 days at 20°C., expressed in parts per million by weight.

(b) "City" shall mean the Corporation of the City of Peterborough.

(c) "Garbage" shall mean solid wastes from the preparation, cooking, and dispensing of food.

(d) "Industrial Wastes" shall mean the liquid wastes from industrial processes as distinct from sanitary sewage.

(e) "Properly Shredded Garbage" shall mean the wastes from the preparation, cooking, and dispensing of food that have been shredded to such degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particle greater than 1/2 inch in any dimension.

(f) "Natural Outlet" shall mean any outlet into a watercourse, pond, ditch, lake, or other body of surface or ground water.

..... 81

(g) "Person" shall mean any individual, firm, company, association, society, corporation, or group.

(h) "Public Sewer" shall mean a sewer in which all owners of abutting properties have equal rights, and is controlled by the City.

(i) "pH" shall mean the logarithm of the reciprocal of the weight of hydrogen ions in grams per litre of solution.

(j) "Sanitary Sewer" shall mean a sewer which carries sewage and to which storm and surface waters are not intentionally admitted.

(k) "Building Sewer" shall mean the sewer connecting any building with a public sewer.

(l) "Storm Sewer" or "Storm Drain" shall mean a sewer which carries storm and surface waters, but excludes sewage and polluted industrial wastes.

(m) "Suspended Solids" shall mean solids that either float on the surface of, or are in suspension in water, sewage, or other liquids; and which are removable by laboratory filtering.

SECTION II

BUILDING SEWERS

1. No building sewer shall be constructed for the discharge of industrial wastes into any public sewer, without first obtaining a written permit from the City Engineer. The permit application shall be supplemented by any plans, specifications, or other information considered pertinent in the judgment of the City Engineer.

2. All costs and expense incident to the installation and connection of a building sewer shall be borne by the Owner. The Owner shall indemnify the City for any loss or damage that may directly or indirectly be occasioned by the installation of the building sewer.

SECTION III

USE OF THE PUBLIC SEWERS

1. No person shall discharge or cause to be discharged any storm water, surface water, roof runoff, cooling water or unpolluted industrial process waters to any sanitary sewer.

2. Storm water and all other unpolluted drainage shall be discharged to such sewers as are specifically designated as storm sewers, or to a natural outlet approved by the City Engineer. Industrial cooling water or unpolluted process waters may be discharged, upon approval of the City Engineer, to a storm sewer, combined sewer or natural outlet.

3. Except as hereinafter provided, no person shall discharge or cause to be discharged any of the following described water or wastes to any public sewer:

(a) Any liquid or vapor having a temperature higher than 150°F.

(b) Any water or waste which may contain more than 100 parts per million, by weight, of fat, oil, or grease.

(c) Any gasoline, benzine, naphtha, fuel oil, wax, or other flammable or explosive liquid, solid or gas.

(d) Any garbage that has not been properly shredded.

(e) Any ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, wool, hair, feathers, tar, plastics, wood, paunch manure, or any other solid or viscous substance capable of causing obstruction to the flow in sewers, or other interference with the proper operation of the sewage works.

(f) Any waters or wastes having a pH lower than 6.0 or higher than 9.0, or having any other corrosive property capable of causing damage or hazard to structures, equipment and personnel of the sewage works.

(g) Any waters or wastes containing cyanide or chromium.

(h) Any waters or wastes containing a toxic or poisonous substance in sufficient quantity to injure or interfere with any sewage treatment process, and constitute a hazard to humans or animals, or create any hazard in the receiving waters of the sewage treatment plant.

(i) Any waters or wastes containing suspended solids of such character and quantity that unusual attention or expense is required to handle such materials at the sewage treatment plant.

(j) Any noxious or malodorous gas or substance capable of creating a public nuisance.

4. Grease, oil, and sand interceptors shall be provided when, in the opinion of the City Engineer, they are necessary for the proper handling of liquid wastes containing grease in excessive amounts, or any flammable wastes, sand, and other harmful ingredients; except that such interceptors shall not be required for private living quarters or dwelling units. All interceptors shall be of a type and capacity approved by the City Engineer, and shall be located as to be readily and easily accessible for cleaning and inspection. Grease and oil interceptors shall be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature. They shall be of substantial construction, water-tight, and equipped with easily removable covers which when bolted in place shall be gas-tight and water-tight.

5. Where installed, all grease, oil and sand interceptors shall be maintained by the Owner, at his expense, in continuously efficient operation at all times.

6. No shredded garbage or wastes shall be discharged into any public sewer except those from dwelling units. Shredding equipment shall not be powered by more than one-half horse-power.

7. Subject to the provisions of Subsection 11 of this Section, the admission into the public sewers of any waters or wastes having,

(a) a 5-day Biochemical Oxygen Demand greater than 300 parts per million by weight, or,

(b) containing more than 350 parts per million by weight of suspended solids, or,

(c) containing any quantity of substances having the characteristics described in Subsection 3 of this Section, or,

(d) having an average daily flow greater than 100,000 gallons or a maximum rate of flow greater than 150 gallons per minute,

shall be subject to the review and approval of the City Engineer.

Where necessary in the opinion of the City Engineer, the Owner shall provide, at his expense, such preliminary treatment as may be necessary to,

(a) Reduce the Biochemical Oxygen Demand to 300 parts per million and the suspended solids to 350 parts per million by weight, or,

(b) Reduce objectionable characteristics or constituents to within the maximum limits provided for in Subsection 3 of this Section, or,

(c) Control the quantities and rates of discharge of such waters or wastes.

Plans, specifications, and any other pertinent information relating to proposed preliminary treatment facilities shall be submitted for the approval of the City Engineer and of the Medical Officer of Health and no construction of such facilities shall be commenced until said approvals are obtained in writing.

8. Where preliminary treatment facilities are provided for any waters or wastes, they shall be maintained continuously in satisfactory and effective operation by the Owner and at his expense.

9. When required by the City Engineer, the Owner of any property served by a building sewer carrying industrial wastes shall instal a suitable control manhole in the building sewer to facilitiate observations, sampling and measurement of the wastes. Such manhole, when required, shall be accessibly and safely located, and shall be constructed in accordance with plans approved by the City Engineer. The manhole shall be installed by the Owner at his expense, and shall be maintained by him so as to be safe and accessible at all times.

10. All measurements, tests, and analyses of the characteristics of waters and wastes to which reference is made in Subsections 3 and 7 of this Section, shall be determined in accordance with "Standard Methods for the Examination of Water and Sewage", and shall be determined at the control manhole provided for in Subsection 9, or upon suitable samples taken at said control manhole. In the event that no special manhole has been required, the control manhole shall be considered to be the nearest downstream manhole in the public sewer to the point at which the building sewer is connected.

11. No statement contained in this article shall be construed as preventing any special agreement or arrangements between the City and any industrial concern whereby an industrial waste of unusual strength or character may be accepted by the City for treatment, subject to payment therefor by the industrial concern.

SECTION IV

POWERS AND AUTHORITY OF INSPECTORS

1. The City Engineer, the Medical Officer of Health and other duly authorized employees of the City bearing proper credentials and identification shall be permitted to enter upon all properties for the purpose of inspection, observation, measurements, sampling, and testing, in accordance with the provisions of this By-law.

SECTION V

PENALTIES

1. Any person alleged to be violating any provision of this By-law shall be served by the City Engineer or Medical Officer of Health with a written notice which shall state the nature of the alleged violation and provide a reasonable time limit for the satisfactory correction thereof. The said person shall, within the period of time stated in the notice, permanently stop and cease the violations alleged in the said notice.

2. Each day in which any such violation shall continue shall be deemed a separate and continuing offence.

3. Any person convicted of a breach of any of the provisions of this By-law shall forfeit and pay, at the discretion of the convicting magistrate, a penalty not exceeding (exclusive of costs) the sum of Fifty Dollars for each offence.

4. Every such penalty shall be recoverable under The Summary Convictions Act, all the provisions of which shall apply except that the imprisonment may be for a term of not more than six months.

(Sgd.) J. A. Dewart
MAYOR

S E A L

(Sgd.) E. A. Outram
CLERK

..... 86

APPENDIX F

PETERBOROUGH MUNICIPAL SURVEY - 1970

SUMMARY OF RECOMMENDATIONS CONCERNING INDIVIDUAL COMPANIES

COMPANY	RECOMMENDATIONS
Canadian General Electric	Review of water use at wire enameling ovens to determine the source of phenols in the storm sewer.
	Investigation of potential problems and accidents.
DeLaval Company Limited	Waste treatment of normal wastes.
	Batch treatment and alternate disposal of strong wastes.
Nashua Canada Limited	Divert contaminated wash waters and floor drains to sanitary sewers.
Mohan-Hunter Dairy	Installation of check valve and discharge to sanitary sewer.
Ovaltine Food Products	Reduction of BOD_5 by: (1) sealing spent mash line (2) reducing losses on screen cleaning
Outboard Marine Corp.	Improved treatment for chromium removal in wastes discharged to sanitary sewer.
Peterborough Plating Co. Ltd.	Curbing plating tanks to prevent serious spills to sewer.
Raybestos-Manhattan (Canada) Ltd.	Removal of lead, zinc, and oil from discharge.
Sargent Hardware of Can. Ltd.	Diversion of plating rinse waters to sanitary sewer.
Silverwood Industries Ltd.	Removal of cooling water from sanitary sewer.